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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,328	05/18/2006	Viktos Genrihovich Vins	GVVO-001	6021

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EXAMINER	
MARTINEZ, BRITTANY M	
ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,328	VINS, VIKTOS GENRIHOVICH	
	Examiner	Art Unit	
	BRITTANY M. MARTINEZ	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Citation to the Specification will be in the following format (S. p. #, LL) where # denotes the page number and LL is the line number. Citation to U. S. Patent literature will be in the format (Inventor, c. #, l. LL) where # is the column number and LL is the line number. Foreign patent literature will be in the format (Inventor, P) where P denotes the paragraph number.

Status of Application

Claims 1-3 have been examined.

Priority

The instant application is a national stage entry of PCT/RU04/00205, filed 5/27/2004.

1. Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on Application No. 0032119470, filed in the Russian Federation on June, 26, 2003. Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of any foreign application. A new oath, declaration or application data sheet is required in the body of which the present application should be identified by application number and filing date.

1. Further, should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a certified English translation of

the foreign application must be submitted in reply to this action. 37 CFR 41.154(b) and 41.202(e).

2. Failure to provide a certified translation may result in no benefit being accorded for the non-English application.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102/103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claim 1** is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fritsch et al. (*The Nature of Color in Diamonds*).

5. Fritsch discloses a natural red diamond type Ia diamond (Fritsch, p. 35, "Table 1") absorbing at about 550 nm (Fritsch, p. 38, 4th paragraph), substantially as in the instant. Although Fritsch does not specifically disclose stable NV color centers that impart a red color to said diamond, this limitation is inherent, as evidenced by the instant specification: "NV centers are isolated substitutional nitrogen atoms and vacancies in the neighboring lattice sites. Such defects absorb in the red spectral region at wavelengths less than 640 nm (1.945 eV) and they are responsible for a red diamond color" (S. p. 1, 0008). Thus, Fritsch anticipates the limitations of **Claim 1** of the instant.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritsch et al. (*The Nature of Color in Diamonds*) as applied to **Claim 1** above, and further in view of the Applicant's admitted prior art and Vagarali et al. (U.S. 6,692,714 B2).

7. With regard to **Claims 2 and 3**, Fritsch teaches that natural near-colorless diamonds can change color via irradiation and subsequent heating (Fritsch, p. 33, second paragraph).

8. Fritsch does not specifically disclose using a diamond containing A centers; subjecting said diamond to HPHT-treatment in a high-pressure apparatus at a temperature exceeding 2150^{o}C and under a stabilizing pressure of 6.0-7.0 GPa, to cause A center dissociation and C center formation in said diamond; irradiating said

diamond with $5 \cdot 10^{15}$-$5 \cdot 10^{18}$ cm^{-2} 2-4 MeV electrons to produce a large number of vacancies in said diamond; and annealing said diamond in a vacuum at a temperature exceeding 1100 °C, at which vacancies migrate and get trapped at C centers to form stable NV color centers (**Claim 2**); using a high-nitrogenous diamond containing over 800 ppm of nitrogen in the form of A and B1 centers; irradiating said diamond with high-energy electrons with the irradiation dose over 10^{19} cm^{-2} to produce interstitial nitrogen atoms and vacancies in said diamond; and annealing said diamond at a temperature exceeding 1100 °C, at which interstitial nitrogen atoms annihilate with vacancies to form C centers and then the newly formed C centers capture more vacancies to form stable NV color centers (**Claim 3**).

9. With regard to **Claims 2 and 3**, Applicant discloses as prior art a technique of producing a natural red-yellow diamond, comprising the steps of: (a) using a natural diamond, (b) irradiating said diamond with $5 \cdot 10^{15}$-$5 \cdot 10^{18}$ cm^{-2} electrons, and (c) annealing said diamond in a vacuum at a temperature from 300 to 1900°C (S. p. 1, 0002). Further, it is well-known in the art to utilize 2-MeV electrons in the irradiation of diamonds (See Background reference, Collins et al., "Colour changes produced in natural brown diamonds by high-pressure, high-temperature treatment," *Diamond and Related Materials*, p. 118).

10. With regard to **Claims 2 and 3**, Vagarali discloses that it is now common practice to anneal diamonds at higher temperatures in order to eliminate signs of irradiation (Vagarali, c. 4, l. 15-18). Thus, it would have been obvious to one of ordinary skill in the art to modify the technique of the prior art with a higher annealing temperature as taught

by Vagarali in order to obtain a process capable of producing diamonds of higher economic value (Vagarali, c. 4, l. 15-18).

11. With regard to **Claim 2**, Applicant further discloses prior art that teaches the most common nitrogen impurity forms are A centers (S. p. 1, 0006); electron irradiation produces a large number of vacancies in diamond; and annealing following irradiation allows stable NV color centers to be obtained (S. p. 1, 0008). Thus, it would have been obvious to one of ordinary skill in the art to modify the technique of Fritsch with the process treatment conditions of the prior art disclosed by Applicant because there would be a reasonable expectation of success.

12. With regard to **Claim 2**, Vagarali discloses subjecting natural brown type Ia diamonds to HPHT-treatment in a high-pressure apparatus at a temperature of about 2550^{o}C and under a stabilizing pressure of 6.0 GPa, to cause a color change to an intense yellow in said diamond (Vagarali, c. 10, l. 13-17; c. 11, l. 40-45). Vagarali teaches that brownish diamonds are the most common type Ia diamonds and that near-colorless diamonds have most nitrogen in the form of A or B centers. Vagarali further teaches that isolated nitrogen atoms in the form of C centers produce an intense yellow color (Vagarali, c. 2, l. 7-20). Thus, one of ordinary skill in the art would recognize that the above exemplified color change of Vagarali would indicate A center dissociation and C center formation in said diamond.

13. Thus, with regard to **Claim 2**, it would have been obvious to one of ordinary skill in the art to modify the irradiation and annealing technique of the prior art with the HPHT-treatment of the prior art in order to obtain a process capable of changing less-

desirable brown diamonds to more desirable fancy color diamonds (Vagarali, c. 3, l. 31-60).

14. With regard to **Claim 3**, Applicant further discloses prior art that teaches type Ia natural diamonds may contain up to 0.3 atomic % of nitrogen, which is 3,000 ppm nitrogen; the most common nitrogen impurity forms are A centers and B1 centers (S. p. 1, 0006); electron irradiation produces a large number of vacancies and self-interstitials in diamond; annealing following irradiation allows stable NV color centers to be obtained (S. p. 1, 0008); and high energy electron irradiation (10^{22} m^{-2} 2 MeV) (S. p. 1, 0008).

15. Thus, with regard to **Claim 3**, it would have been obvious to one of ordinary skill in the art to modify the technique of the prior art with process treatment conditions of the prior art disclosed by Applicant because there would be a reasonable expectation of success.

Conclusion

1. No claim is allowed.

2. In general, prior art renders the claimed invention anticipated and obvious.

3. Applicant is required to provide pinpoint citation to the specification (i.e. page and paragraph number) to support any amendments to the claims in all subsequent communication with the examiner. **No new matter will be allowed.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRITTANY M. MARTINEZ whose telephone number is

(571) 270-3586. The examiner can normally be reached Monday-Thursday 7:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wayne Langel/
Primary Examiner, Art Unit 1793

BMM
/Brittany M Martinez/

Examiner, Art Unit 1793